

Electronic Cigarettes

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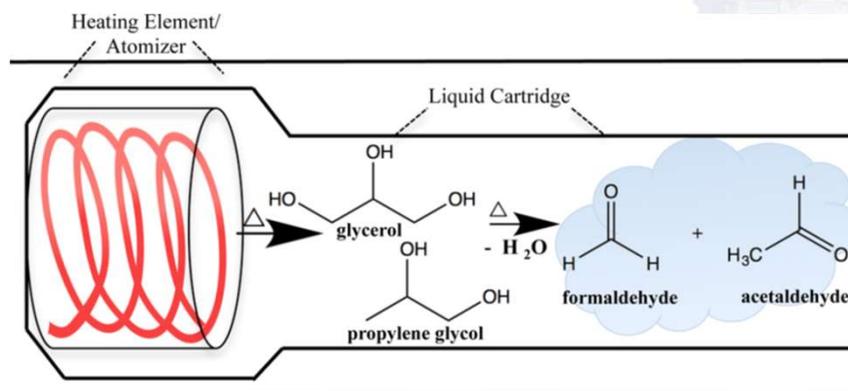
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Anatomy of an Electronic Cigarette

An e-cigarette is a battery-operated nicotine delivery device consisting of a heating chamber and a liquid-containing cartridge.



Klager et al. Env Sci & Techn. 2017



Anatomy of an Electronic Cigarette

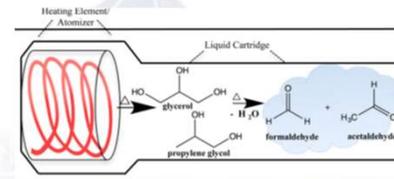
CONTENTS

Flavoring compounds
Propylene Glycol, Glycerol
Formaldehyde

All approved by the FDA

All found in the Generally Recognized as Safe list (GRAS)

BUT



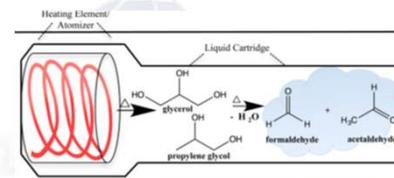
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GRAS list compounds are tested and approved for
INGESTION only, not for inhalation



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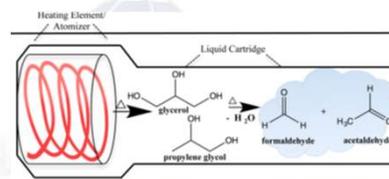


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e.g. *Diacetyl* – a flavoring used in electronic cigarettes.

Used in popcorn flavoring, Pop Tarts, candy corn

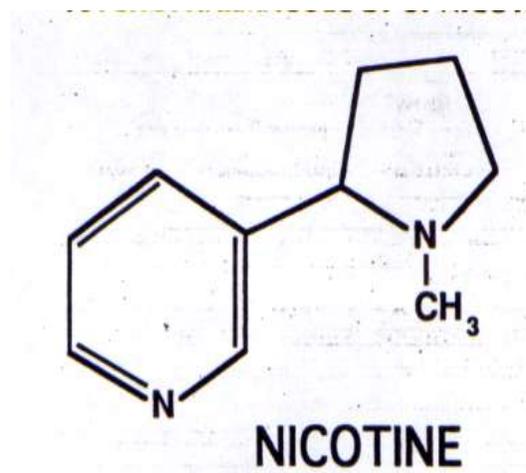


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Fixed Obstructive Lung Disease in Workers at a Microwave Popcorn Factory --- Missouri, 2000—2002
CDC MMWR April 2002



So... Why *DO* People Smoke?



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<https://www.premiumcigarette.com/>

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Combustible Cigarettes

Variability in Cigarette (Marlboro)

Brand	Tar Yield (mg/cig)	Nicotine (mg/cig)
Marlboro Ice	1.0	0.0
Marlboro Blast	4.0	0.2
Marlboro Refined	6.0	0.3
Marlboro Black	7.0	0.4
Marlboro Red	12.0	0.5
Marlboro Red 20S	13.0	0.6

12/2/2019

https://www.govtlab.gov.hk/english/pub_tnrpt.htm

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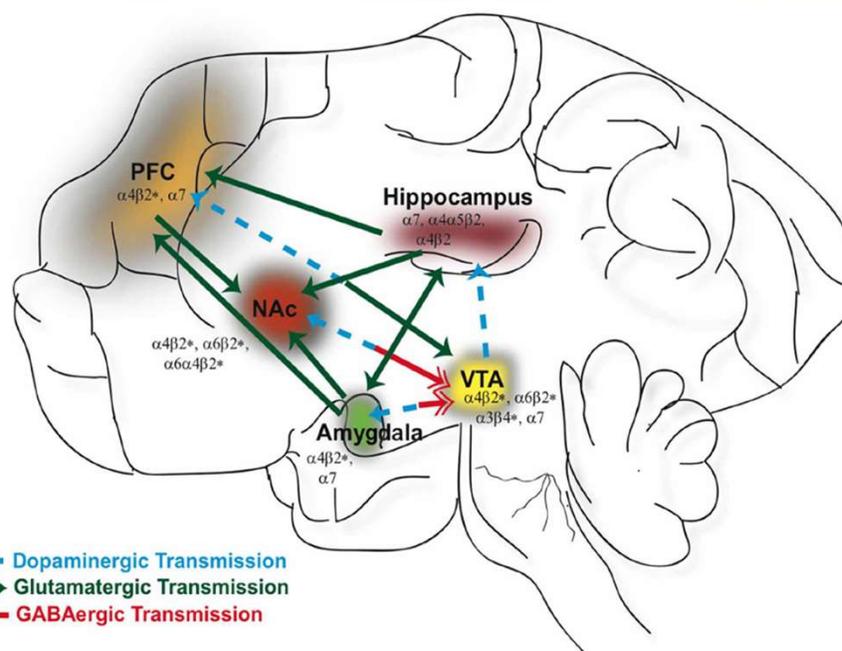
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Long term changes

- Increased density of nicotinic receptors
- Increased sensitivity of receptor ion channels
- Changes gene expression
 - Neuronal protein synthesis increases
 - Neurotransmitter synthesis increases

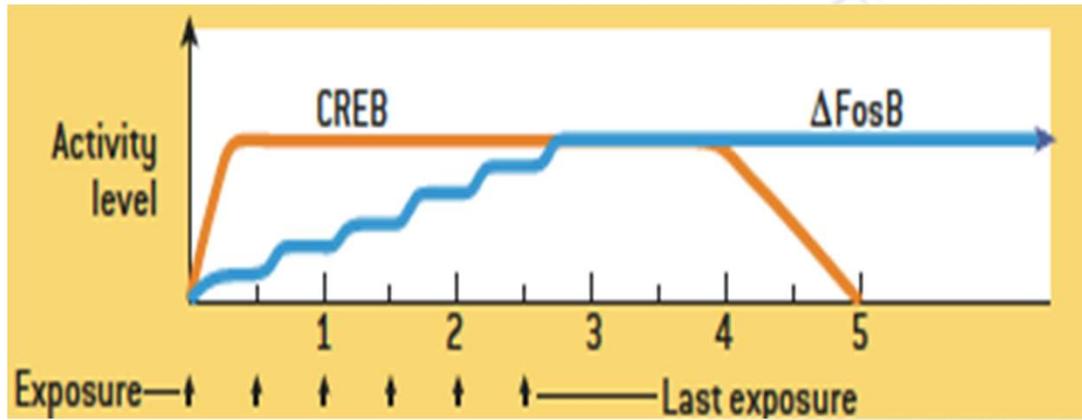


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CREB versus Δ FosB



Nestler EJ & Malenka RC. *Scientific America*. 2014



Questions

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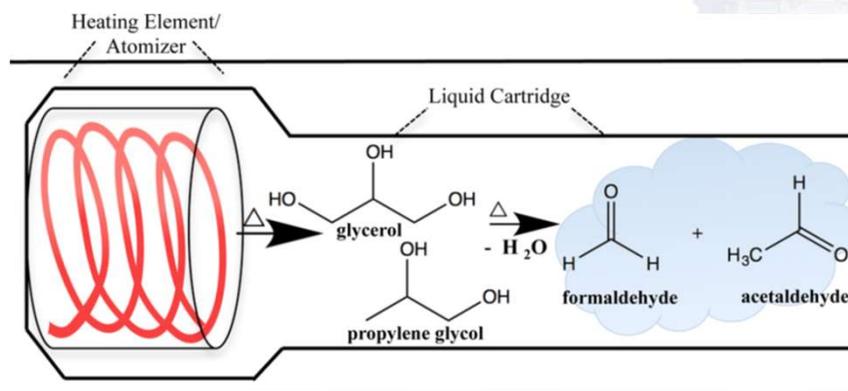
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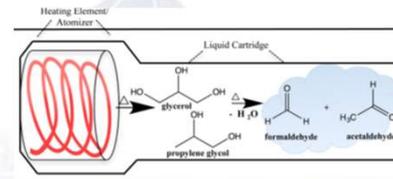
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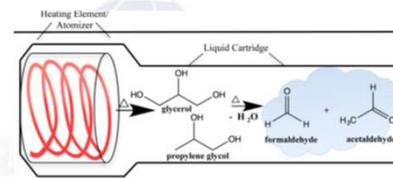
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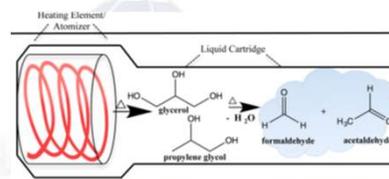


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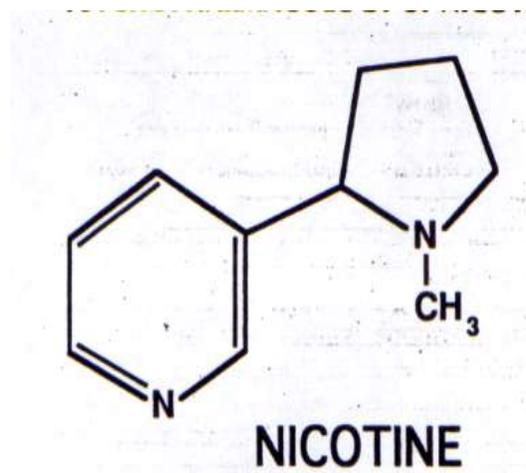


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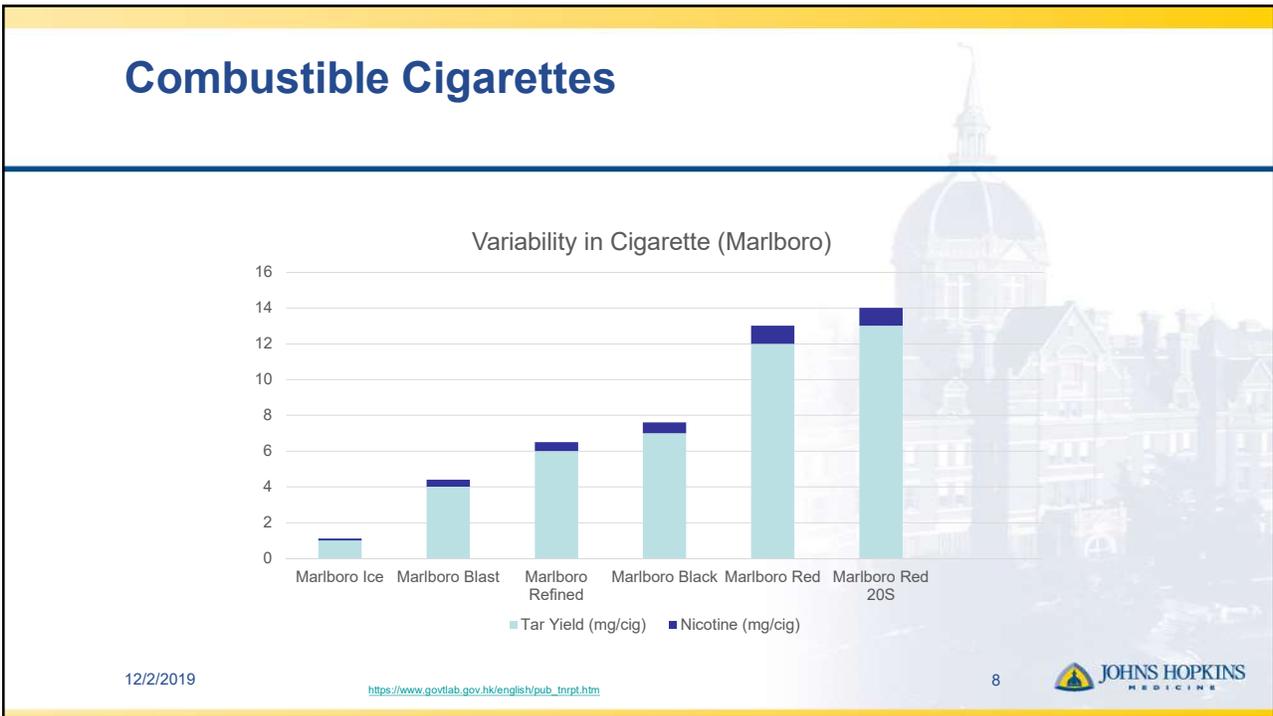


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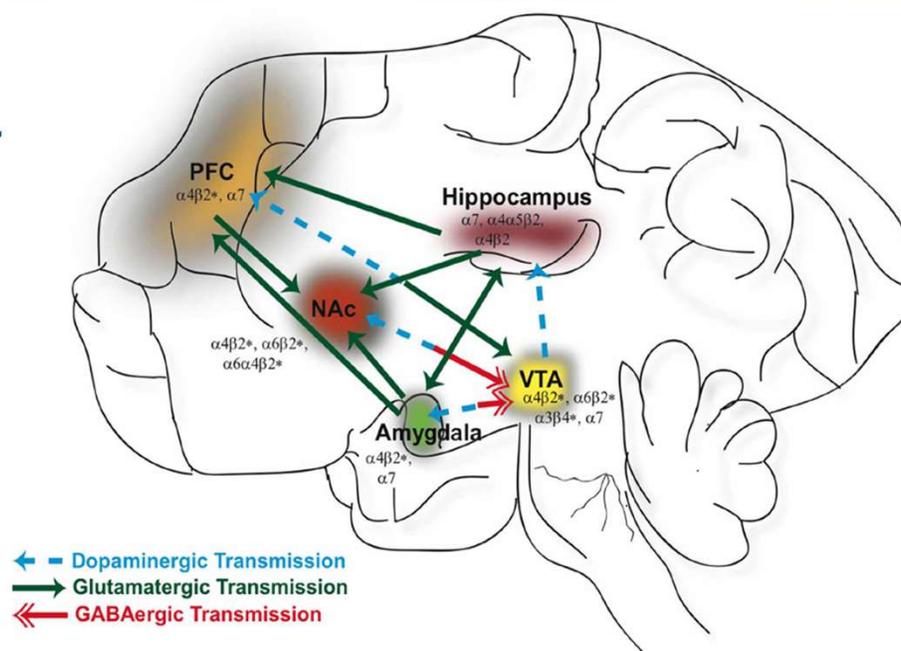


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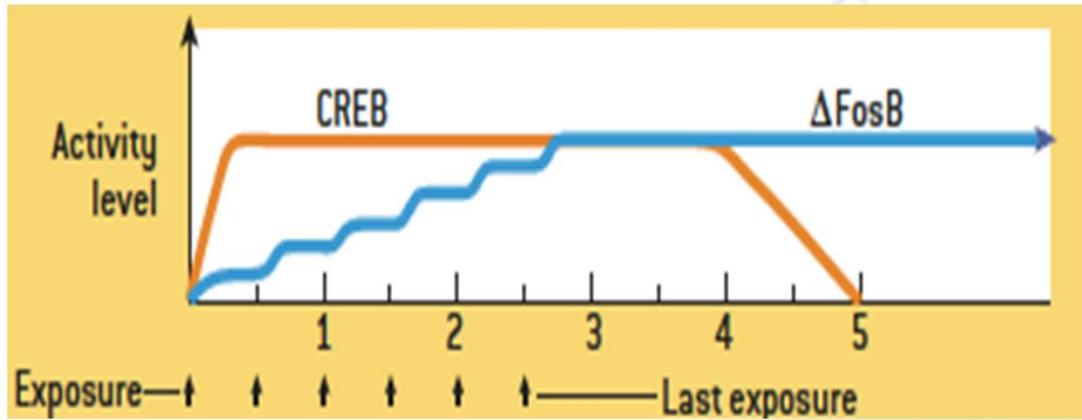


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